

Resource Action: EWG – 68A

Task Force Recommendation Category: 1

Potential Recharge of Waterfowl Brood Ponds on the Thermalito Afterbay

1.0 Description of Potential Resource Action:

This Potential Resource Action involves evaluation of potentially suitable methodologies to insure that waterfowl brood ponds retain sufficient water throughout the primary waterfowl brooding season to remain functional. This Resource Action is one of several waterfowl related Resource Actions currently under consideration to minimize the affects of project operations on waterfowl reproduction.

1.1 Background

The Department of Water Resources (DWR), California Department of Fish and Game (DFG), California Waterfowl Association (CWA), and other stakeholders have worked cooperatively over the last 15 years to increase waterfowl production on the Afterbay. One cooperative program to address the reduced cover associated with Afterbay operations involved construction of waterfowl brood ponds. These ponds are constructed by creating a small earthen dam across an inlet of the Afterbay. These impoundments maintain a relatively stable water surface elevation which allows the establishment of emergent vegetation as well as submerged aquatic habitat. Further, these impoundments would create conditions where the open water and terrestrial cover habitats are immediately adjacent. These brood ponds can significantly reduced waterfowl brood mortality. However, water losses to evapotranspiration, groundwater recharge, and evaporation serve over time to reduce the water level in these impoundments. Estimated water losses within the brood ponds are 2 to 3 inches of water surface elevation per week during March and April and 4 inches per week from May through September.

Four of the existing waterfowl brood ponds were designed to be recharged at Afterbay water surface elevations of 134.1 feet or higher. One brood pond was engineered at an elevation which precludes recharge via the Afterbay. However, DFG can pump water into this pond if the Afterbay water surface elevation reaches 134.1 feet. Under an informal agreement with the stakeholders, DWR has traditionally attempted to recharge these brood ponds through Afterbay water level fluctuations at regular intervals throughout the primary brooding season (April 15 through July 31). Field observations during the course of relicensing indicate that recharge of brood ponds at three week intervals during the waterfowl brooding season will provide adequate water to maintain the functionality of the ponds.

Stakeholders have suggested that alternative means of brood pond recharge may be substituted for Afterbay water level fluctuations. These alternatives may include pumping from the Afterbay into the brood pond or development of a system of ground water wells which could be pumped to recharge the brood ponds.

These reports are for discussion purposes only, and do not denote support by the EWG Collaborative.

**Oroville Facilities Relicensing Efforts
Draft Narrative Reports for Resource Action Discussion**

The waterfowl brood ponds are constructed to reduce brooding waterfowl losses and increase production. The brood ponds also receive disproportionately heavy use during waterfowl courtship water prior to the nesting season. The existing brood ponds provide improved habitat conditions for a variety of terrestrial and aquatic species including special status species.

2.0 Nexus to Project:

Water level fluctuations on the Thermalito Afterbay related to hydropower generation can adversely affect brooding waterfowl under certain conditions. Physical topography of the Thermalito Afterbay is such that even relatively minor lowering of the water surface elevation can result in extensive areas of exposed open mudflats along the northern and eastern edges. These mudflats contain little or no cover. Further, as drawdown continues the distance from open water to cover increases. Under these exposed conditions waterfowl broods are subject to high predation rates.

**Figure 1. Exposed mud flats at Thermalito Afterbay
(water surface elevation (124.0))**



3.0 Potential Environmental Benefits:

The waterfowl brood ponds were constructed to reduce brooding waterfowl losses and increase production. The brood ponds also receive disproportionately heavy use as waterfowl pair water prior to the nesting season. The existing brood ponds provide

These reports are for discussion purposes only, and do not denote support by the EWG Collaborative.

**Oroville Facilities Relicensing Efforts
Draft Narrative Reports for Resource Action Discussion**

improved habitat conditions for a variety of terrestrial and aquatic species including special status species. A few of the special status species which have been observed on or near these brood ponds include bald eagle, osprey, black tern, American bittern, American white pelican, white-faced ibis, black-crowned night heron, double-crested cormorant, and short-eared owl. Further, these ponds also provide potentially suitable habitat for giant garter snake and red-legged frog (Figure 2)

4.0 Potential Constraints

DWR has historically (under informal agreement) operated the Thermalito Afterbay in a manner which allowed recharge of waterfowl brood ponds during the waterfowl brooding period through operational planning. However, power generation requirements in the future could constrain operational flexibility and require alternative methods of recharge.

5.0 Existing Conditions in the Proposed Resource Action Implementation Area:

This Resource Action will not significantly alter existing conditions. Rather, this Resources Action will formalize at stakeholders request, existing informal agreements and provide guidance to DWR Operations staff on the water surface elevation required to recharge, primary waterfowl brooding season, and frequency and timing of recharge.

Figure 2. High quality giant garter snake and red-legged frog habitat



6.0 Design Considerations and Evaluations:

- Between May 1 and July 15, re-operate Thermalito Afterbay (or other methods) to insure that brood pond is recharged at three week intervals. Recharge via Afterbay fluctuation would require that the surface elevation reaches 134.1 or

These reports are for discussion purposes only, and do not denote support by the EWG Collaborative.

**Oroville Facilities Relicensing Efforts
Draft Narrative Reports for Resource Action Discussion**

greater for a 12-hour continuous period at least every three weeks. Twelve hours are required to recharge the largest brood pond via Afterbay water level fluctuations due to its narrow intake.

- Coordinate recharge events with DFG Oroville Wildlife Area (OWA) staff. This will allow DFG to provide pump recharge into brood pond #4.
- DWR Operations will evaluate this potential Resource Action and identify impacts including costs in water or power, operation flexibility, or other criteria.
- Periodic monitoring will be required to fine tune operational criteria for recharge events.

6.1 Environmental Permitting

- Recharge of waterfowl brood ponds does not require environmental permitting or documentation.

6.2 Threatened and Endangered Species

- Maintenance of spring water surface elevations at the brood ponds would provide habitat benefits to both giant garter snake and California red-legged frog.

6.3 Previous Results

Qualitative observations of the existing waterfowl brood ponds indicate that the brood ponds receive disproportionately high waterfowl use throughout the year compared to unmanipulated areas of the Afterbay. Further, preliminary data indicate that waterfowl brood ponds can reduce waterfowl brood losses and increase production (Anthrop pers. comm.). However, the quality of brooding habitat is reduced as the distance from shoreline cover and open water increases.

6.4 Additional Operations and Maintenance

Brood pond recharge via Afterbay water level fluctuations requires planning and scheduling by DWR Operations. Brood pond recharge via pumpage using a portable diesel pump could require extensive manpower to rotate pumpage among the current 5 brood ponds and four additional proposed brood ponds. Further, fuel and maintenance of the pump would be required.

6.5 Evaluation and Monitoring

The principal evaluation criteria for evaluation of the success of the potential brood ponds will be water level stability during the waterfowl brooding season. No additional monitoring is recommended.

6.6 Closely Related Resource Actions

This Resource Action is closely associated with two potential Resource Actions (EWG-56 – Construction of Additional Waterfowl Brood Ponds and EWG-57A - Waterfowl Nesting Cover Enhancements). All three potential Resource Actions work together to minimize the potential adverse impacts associated with Afterbay water level fluctuations on waterfowl survival and production.

These reports are for discussion purposes only, and do not denote support by the EWG Collaborative.

**Oroville Facilities Relicensing Efforts
Draft Narrative Reports for Resource Action Discussion**

EWG-57A provides nesting habitat for waterfowl displaced by Afterbay water level fluctuations while EWG-68A identifies opportunities for additional waterfowl brood ponds.

7.0 Synergism and Conflicts:

The goal of this Resource Action is to (in coordination with EWG-56 and 57A) improve waterfowl nesting, production, and survival. Although incremental benefits can be provided through implementation of any of the three potential Resource Actions, they will be most effective if implemented as a package. Additional brood pond construction is most effective if the ponds can be filled and maintained at levels where suitable cover is adjacent to brood water during the waterfowl brooding period. Providing adequate brooding habitat within ¾ miles of high quality nesting habitat minimizes waterfowl losses during critical waterfowl life stages.

8.0 Uncertainties:

Over the last 15 years the brood pond concept has proven to be an effective management tool at the Thermalito Afterbay, providing a relatively stable source of cover for young ducklings in comparison to the Afterbay.

9.0 Cost Estimates:

Some loss of operational flexibility may occur. However, historically planning and scheduling of recharge events has not substantially reduced operational flexibility (Curtis Creel Pers. Comm.)

Cost associated with pumpage include

- Initial purchase of suitable portable pump and pipes \$15,000-\$20,000
- Manpower costs associated with rotating a portable pump between brood pond locations (\$18,000/year)
- Annual pump maintenance and fuel (\$500 -\$1,000/year)

10.0 Recommendations:

Brood ponds are an effective, documented method to reduce the affects of water level fluctuations at the Thermalito Afterbay on waterfowl survival and production. Further, the brood ponds provide habitat diversity within the Thermalito portion of the OWA resulting in increased wildlife species diversity benefiting a wide range of wildlife species including several special status species.

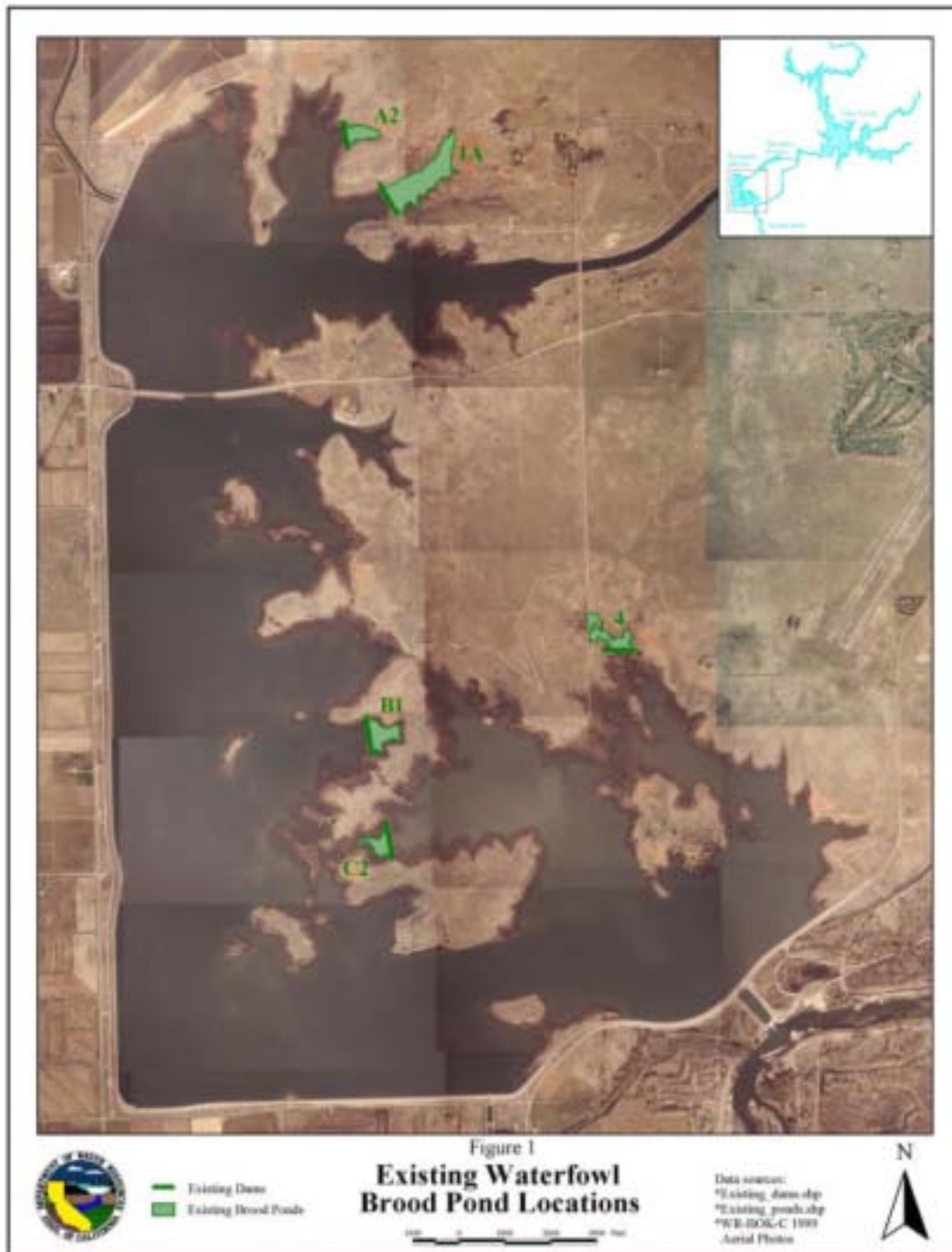
11.0 Literature Cited

Dr. Don Anthrop personal communication April 2003

Curtis Creel, Department of Water Resources, personal communications

These reports are for discussion purposes only, and do not denote support by the EWG Collaborative.

Oroville Facilities Relicensing Efforts
Draft Narrative Reports for Resource Action Discussion



These reports are for discussion purposes only, and do not denote support by the EWG Collaborative.

Oroville Facilities Relicensing Efforts
Draft Narrative Reports for Resource Action Discussion



These reports are for discussion purposes only, and do not denote support by the EWG Collaborative.